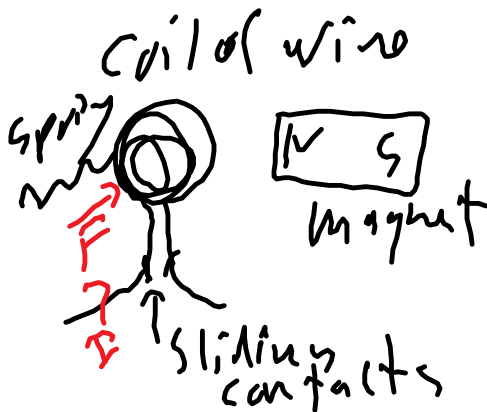


## Ammeters, Voltmeters and Galvanometers

Galvanometer - measures small currents.  
Analogue devices work on the principle that if you run a current near a magnet, the wire experiences a magnetic force.



You can build an ammeter and voltmeter using a galvanometer.

Say a galvanometer get fully deflected - spring is fully extended, when you have 40 micro ampères of current flowing through it.

You want to build a voltmeter that reads 5.0V when fully deflected. What do you do?

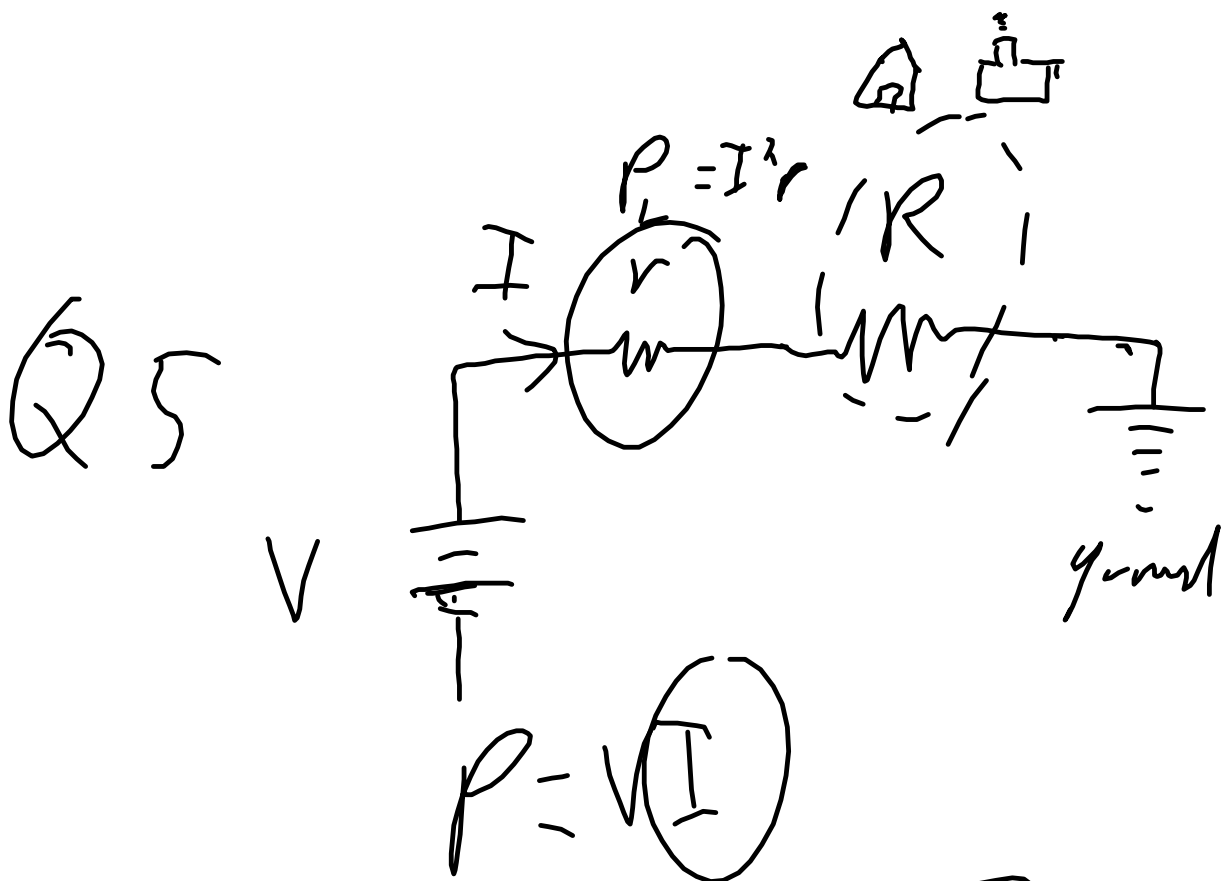
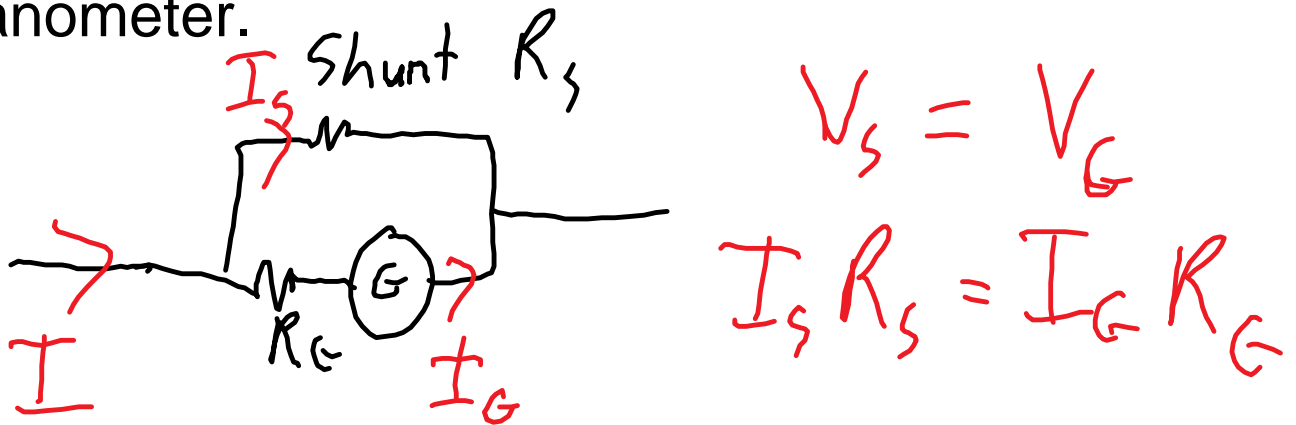
You put a resistor, called a multiplier, in series with the galvanometer.

$$V=IR \quad R=V/I = 5.0V/40 \mu A = 5/4=125 \text{ k}\Omega$$

If you want to build an ammeter, you want lots of

current to flow, without all going through the galvanometer. How do you do that?

A shunt resistor has little resistance, so it will take most of the current if it is in parallel to the galvanometer.



$$P_r \approx 2.4$$

Formal Lab due Tuesday (purpose, procedure,  
hypothesis, observations, analysis (discussion)  
conclusion, sources of uncertainty

p502 Q43-51 odds

Practice Test handout

Quiz next class